MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2018/2019

PMT0104 – FUNDAMENTAL MATHEMATICS I
(All sections / Groups)

29 MAY 2019
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of **3 pages** including cover page with **4 Questions** only.

2. Answer all **FOUR (4)** questions

3. Write all your answers in the answer booklet provided.

4. Only NON-PROGRAMMABLE calculators are allowed.

Question 1 (25 Marks)

a) Perform the indicated operations and simplify the result.

   i. $\dfrac{5x+6}{x+1}+\dfrac{7x-3}{9x}$ **(5 marks)**

   ii. $\dfrac{2x-2}{x}\cdot\dfrac{8x^2}{6x-6}$ **(4 marks)**

   iii. $\dfrac{\frac{5}{7}+\frac{3}{x}}{\frac{2}{x}+1}$ **(6 marks)**

b) Write the expression in standard form $a + bi$.

$$\frac{4+3i}{3-2i}$$

                                                         (6 marks)

c) Simplify the expression. Express the answer so that all exponents are positive.

$$\left(\frac{-2x^{1/3}y^{1/2}}{3z^{-5}}\right)^{-2}$$

                                                         (4 marks)

Question 2 (25 Marks)

a) Solve the equation.

   i. $(2x-1)(x+3)=(2x+1)(x-3)$ **(3 marks)**

   ii. $\dfrac{x-2}{x-5}=\dfrac{x+6}{x-7}$ **(4 marks)**

   iii. $|3x+5|+2=8$ **(5 marks)**

b) Solve the quadratic equation by using given method.

   i. $x^2-10x+24=0$ (factoring)   **(2 marks)**

   ii. $x^2+3x+4=0$ (completing the square)   **(5 marks)**

c) Solve the inequality. Express the answer in interval notation.

   i. $12 \le 4x+4 \le 16$ **(3 marks)**

   ii. $|2x-3|<6$ **(3 marks)**

Continued...

Question 3 (25 Marks)

a) Given a function
$$f(x) = \frac{x^2 + 3}{2x - 4}$$

    i.   Is point (3,5) on the graph of f?   **(2 marks)**

    ii.   Find x when $f(x) = -2$.   **(3 marks)**

b) Graph the function using the techniques of transformations. Start with the graph of the basic function and show all the stages.
$$f(x) = (x + 4)^2 - 1$$
    (6 marks)

c) Find the inverse of the following function.
$$f(x) = \frac{-5x + 2}{4x + 3}$$
    (4 marks)

d) Use the synthetic division to determine quotient and remainder when the function $f(x) = 3x^3 - 4x^2 + 2x - 10$ is divided by

    i. $x + 2$ **(5 marks)**

    ii. $x - 1$ **(5 marks)**

Question 4 (25 Marks)

a) Given a sequence
$$-3, 12, -48, 192, \ldots$$

    Find

    i.   7th term of the following sequence.   **(3 marks)**

    ii.   sum of the first 7 terms.   **(4 marks)**

b) Expand $(3x - 2)^4$ by using Binomial Theorem.   **(4 marks)**

c) A straight line L containing two points, $P_1 = (2, -3)$ and $P_2 = (-5, 4)$. Determine

    i.   the distance from P_1 to P_2.   **(3 marks)**

    ii.   the midpoint of the line segment joining P_1 and P_2.   **(2 marks)**

    iii.   the equation of straight line containing P_1 and P_2.   **(4 marks)**

    iv.   the equation of a parallel line to L that passing through point $(3, -1)$.   **(5 marks)**

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